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EREBOMYRMA, A NEW GENUS OF HYPOGÆIC ANTS FROM TEXAS.¹

WILLIAM MORTON WHEELER.

The occurrence of a new genus of ants in a country so long known to entomologists as the United States is a matter of surprise when we reflect that the Formicidæ constitute a much smaller family and one much better understood taxonomically than many of those that go to make up the great order of the Hymenoptera, and that, notwithstanding the zeal of collectors, new ant genera are rarely brought to light at the present time even in the most remote and inaccessible regions of the globe.

Early in October Mr. W. H. Long, Jr., kindly sent me from Denton, near the northern boundary of Texas, a number of ants, which, had only the minute yellow workers been present, I should have regarded at first sight as specimens of our common *Solenopsis molesta* Say. But the large males and still larger females in the same vial were so unlike any ants I had ever seen that I undertook a more careful examination of the workers and found them to differ not only from any of the known American genera but also from the Old World genera as well.

In response to a request for data concerning the capture of the specimens, Mr. Long sent me the following: "I have seen this species only once. That was early one morning (I believe it was September 21) after a warm rain the night before. My attention was attracted by an old hen greedily devouring the winged forms as they issued from a small hole in a clear, open space in my back yard. There were no rocks, heaps of earth or surface indications of a nest of any kind. Most of the males and females flew away at once, but here and there I saw a few couples mating near the nest. The diminutive workers fondled and clung to the sexual individuals till the latter escaped into the air. There were many more males than females."

The following is a description of the new genus and species which I take pleasure in dedicating to Mr. Long, as a very slight

¹ Contributions from the Zoölogical Laboratory of the University of Texas, No. 45.

acknowledgment of his aid in working out the distribution of our Texan Formicidæ.

EREBOMYRMA gen. nov.¹

Worker.—Diminutive and monomorphic. Integument yellow, almost without pigment.

Head rather large, suboblong, its posterior border nearly straight, its lateral borders slightly convex. Mandibles rather long, with oblique, 4-toothed blades. Clypeus short, with concave median surface and a pair of teeth on its anterior border. These project downwards rather than forwards and are continued upwards as two distinct ridges on the clypeus. Eyes about one third the length of the head from the insertion of the mandibles, very small, consisting of a single indistinct lens and a few granules of pigment. Ocelli absent. Frontal carinæ short, somewhat further apart than in *Solenopsis*, forming on either side a small lappet covering the insertion of the antenna and then suddenly diverging posteriorly and ending abruptly. Frontal area small, triangular, indistinct. Frontal groove obsolete. Antennal foveæ well-developed. Antennæ 11-jointed; scape of the usual form, first to eighth joint of funiculus together hardly as long as the distinctly 2-jointed club; first funicular joint as long as the four succeeding joints taken together and distinctly broader; joints 2-7 broader than long; eighth joint about as long as broad; basal joint of club about two fifths as long as the terminal joint. Labial palpi 2-jointed, maxillary palpi 1-jointed. Thorax considerably narrower than the head, prothorax with rounded humeri, somewhat flattened above and not separated by a distinct suture from the mesothorax; meso- and metathorax of nearly the same width and distinctly narrower than the prothorax; meso- and epinotum separated by a deep constriction, epinotum armed on either side with a flattened tooth which is hardly longer than broad at its base and continued downwards and backwards as a distinct lamella; dorsal and declivous surfaces of epinotum of about equal length. Petiole in profile much larger than the postpetiole; with a high, rounded node and a slender median tooth on its anterior ventral surface. Seen from above the petiole is more than twice as long as broad, widest behind the middle, slender and subpedunculate in front. Postpetiole seen from above broader behind than in front, campanulate, its posterior edge about twice as broad as the petiole; in profile its dorsal and ventral surfaces are moderately convex. Gaster rather small, narrower than the head, elongate elliptical and somewhat flattened dorsoventrally; anal opening distinctly on the ventral surface, in front of the apex of the gaster. Sting small and apparently vestigial. Legs robust, the femora and tibiæ incrassated, the former towards

¹ From Ἐρεβος, Erebos and μύρμος, ant; an allusion to the subterranean habits and the gloomy coloring of the males and females.

the middle, the latter towards their distal ends. Middle and hind tibiæ without spurs. Claws simple.

Female.—Very large as compared with the worker; deeply colored.

Head subquadrate, convex above; posterior border slightly concave, sides nearly parallel, posterior angles rounded. Eyes and ocelli rather small, the former round and placed in front of the middle of the head; median ocellus depressed. Mandibles convex, with oblique 6-toothed blades. clypeus short and broad, somewhat flattened in the middle, the teeth and their longitudinal ridges on the anterior border obsolescent. Frontal carinæ short, rather evenly diverging posteriorly, in front forming a slight fold over the antennal insertion. Frontal area triangular, longer than wide, continued back as a rather deep frontal groove as far as the anterior ocellus, just in front of which it becomes somewhat broader. Antennæ 11-jointed; scape very short, not reaching the posterior orbit, distinctly incrassated. Funiculus short and compact, with an indistinctly 3-jointed club, the penultimate joint of which is more than half as long as the terminal joint, the antepenultimate nearly half as long as the penultimate and but little thicker than the basal joints of the funiculus. Thorax of the usual structure; epinotum with a blunt tooth on either side continued downwards to the posterior edge as a low, rounded ridge. Petiole seen from above not broader than long, its base very shortly pedunculate; anterior declivity long and very convex, at the summit passing abruptly into the very concave posterior declivity, so that the summit of the node forms a trenchant transverse ridge; lateral surface on either side longitudinally carinate, ventral surface somewhat compressed and produced anteriorly into an acute median tooth like that of the worker. Postpetiole in profile but little smaller than the petiole, and when seen from above but little broader; its anterior border straight, its anterior angles rounded, its posterior border semicircular and fitting back into a deep semicircular excision of the first gastric segment; sides of the postpetiole carinate. Gaster large, fully two and one half times as long as broad and but little broader than high. Anal opening and sting inconspicuous, decidedly ventral in position. Legs rather short and weak, the terminal joints of the tarsi more tapering than in the worker. Wings of the usual form, long and well developed. Venation much like that of *Solenopsis*, with well-developed radial, cubital and discoidal cell; the last larger than in *Solenopsis* and its opposite sides much more nearly parallel; external branch of cubital vein turning forwards and meeting the costa some distance in front of the tip of the wing; median vein and internal branch of cubital reaching very nearly to the margin of the wing; posterior cross-vein short and perpendicular to the median and internal veins. Pterostigma well developed.

Male.—Much larger than the worker but smaller than the female, deeply colored.

Head in proportion to the thorax much larger than in *Solenopsis*; excluding the eyes distinctly broader than long, rounded behind. Eyes and

ocelli very large and prominent. Cheeks much longer than in *Solenopsis*. Mandibles well developed, overlapping, with very oblique 4-toothed blades. Clypeus about as long as broad, very conspicuously convex, hemispherical, its anterior border somewhat truncated, without teeth. There is a small, round, deep pit on either side near the base of the clypeus. Frontal groove and carinæ hardly developed. Antennæ rather short, 13-jointed, of nearly uniform thickness throughout except for the scape and second joint, the former being somewhat thicker, the latter somewhat narrower than the other joints; scape and joints 3-13 cylindrical, more than twice as long as broad; second joint about half as long as any of the succeeding joints, of the usual shape and not globose as in *Solenopsis*. Thorax large, with unarmed epinotum or in some specimens with only blunt protuberances in the place of the worker armature. Petiole hardly pedunculate, in profile a little longer than high, its lower surface without a tooth, its node moderate, with the anterior declivity longer and more uniformly sloping than the posterior. Postpetiole shorter than the petiole but twice as broad, campanulate, broadly open behind and conspicuously overlapping the first gastric segment especially on the dorsal side. Gaster elongate-elliptical, rather pointed posteriorly, distinctly compressed dorsoventrally. Genitalia more or less, in some specimens considerably, exserted. Legs rather long and slender. Wings like those of the female.

EREBOMYRMA LONGII sp. nov.

Worker.—(Figs. 1 and 2.) Length 1.5-2.25 mm.

Varying from amber yellow throughout to pale brown; only the teeth and edges of the mandibles dark brown or black.

Mandibles shining, somewhat striated, with coarse piligerous punctures. Clypeus in the middle between the longitudinal ridges smooth and shining, sides more opaque and rugose. Anterior angles of head and outer portions of antennal foveæ subopaque, traversed by regular and parallel longitudinal rugæ. Frontal area and upper surface of head smooth and shining, covered with rather coarse piligerous punctures. There are a few longitudinal rugæ extending back from the frontal carinæ half way to the posterior border of the head. Sides and ventral surface of head opaque, reticulate-rugose. Antennal scape reaching half way to the poster or angle of the head, slender at the base and somewhat thickened towards the apex. Pro- and mesonotum smooth and shining, with indistinct piligerous punctures. Mesopleuræ and epinotum coarsely and evenly reticulate-rugose, even to the tips of the teeth and the space included between them. Petiole similarly, but somewhat less coarsely, reticulate-rugose, except on the upper surface of the node which is smooth and shining. Postpetiole, gaster, legs and antennæ smooth and shining.

Whole body covered with rather long and abundant pale yellow hairs which on the mandibles, head and thorax arise from the punctures. These hairs are longest on the clypeus and posterior segments of the gaster.

They are conspicuous on the legs and antennæ, especially on the scape and all the joints of the funiculus except the club. On the upper surface

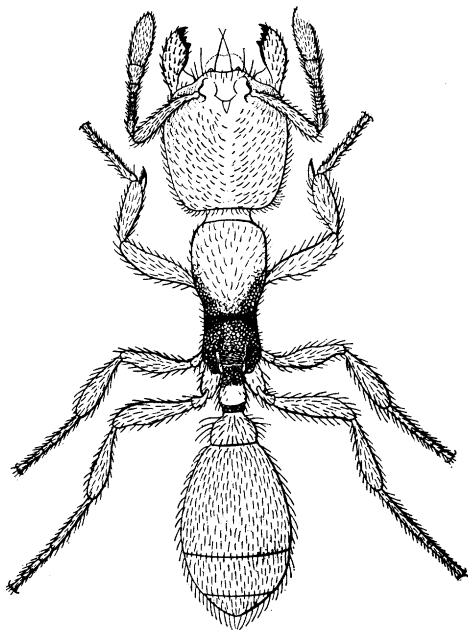


FIG. 1. *Erebomyrma Longii* sp. nov. *Worker*. (Dorsal view.)

of the head the hairs are somewhat more appressed and directed from either side towards the median line which is rather bare. There is no pubescence.

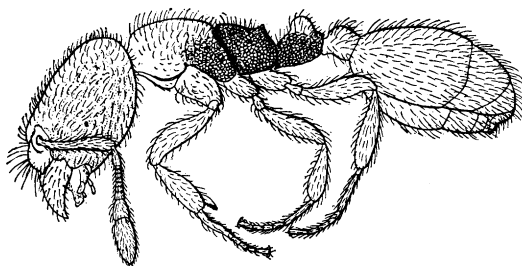


FIG. 2, *Erebomyrma Longii* sp. nov. *Worker*. (Lateral view.)

Female.—(Figs. 3 and 4.) Length 8–8.5 mm.

Black; abdomen, antennæ and legs blood-red; wing insertions, metanotum, lower portions of epinotum, petiole, and postpetiole, the frontal carinæ and lateral portions of clypeus suffused with red; mandibles black, with a broad red band across their apical third; bases of coxæ and middle

portions of femora black ; wings black, except their apical third which is hyaline ; nervures and stigma black.

Mandibles very smooth and shining, covered with coarse piligerous punctures irregularly interspersed with much smaller punctures. Middle portion of clypeus smooth and shining, finely and irregularly punctate ; outer portions grossly punctate except laterally where they are very coarsely longitudinally rugose. Frontal area subopaque. Head opaque, very coarsely and evenly longitudinally rugose, the spaces between the rugæ

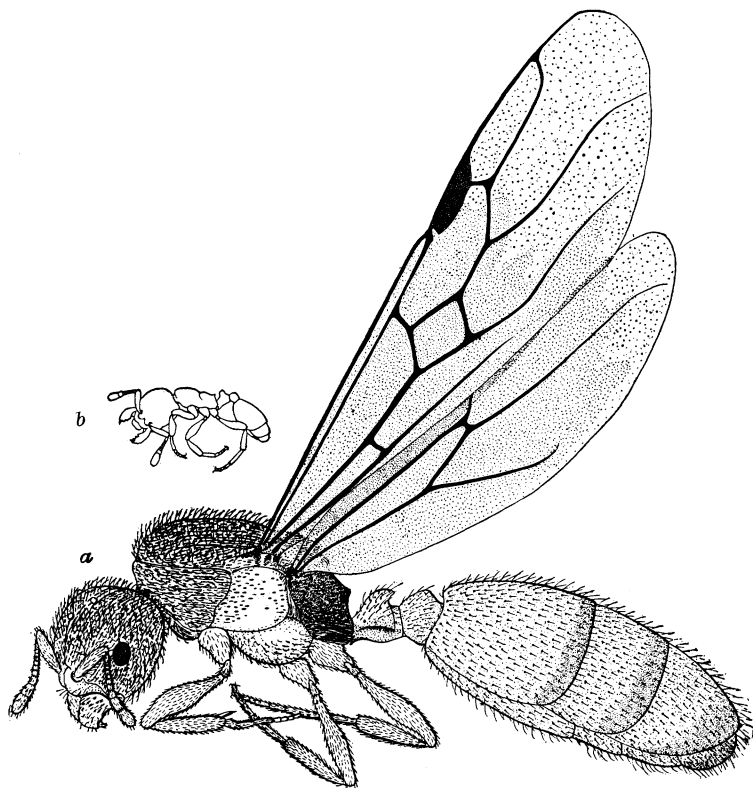


FIG. 3. a. *Erebomyrma Longii* sp. nov. Female. b. Worker drawn under the same magnification.

being faintly and confluent foveolate. In the antennal foveæ the rugæ are beautifully concentric, on the front and sides of the head they are longitudinal, but in the region of the ocelli diverge and separate into two systems, passing to the posterior angles of the head. On the occiput the space between the diverging series is filled by a transverse series of rugæ. Antennal scape rugose and very coarsely punctate, or foveolate. Thorax largely opaque, pronotum and neck more densely reticulate and longitudi-

nally rugose than the head ; mesonotum subopaque, with a smooth, shining band down the middle and along each parapsidal furrow ; with the exception of these regions the whole surface is covered with large elongate-elliptical foveolæ, the spaces between which are more finely punctate and raised into indistinct longitudinal rugæ. Paraptera and scutellum shining, with transversely elliptical foveolæ which are almost absent in the middle of the latter sclerite. Mesopleuræ shining and foveolate like the mesonotum. Surface of metanotum irregularly foveolate and in addition covered with fine, more or less longitudinal rugæ. Epinotum very opaque, densely punctate above and longitudinally rugose below. In the region between the teeth and the ridges running backwards and downwards from them, the surface is crossed by rather coarse transverse rugæ. Convex dorsal surface of petiole very smooth and shining, finely and sparsely punctate and with a few round foveolæ which are most numerous along the posterior

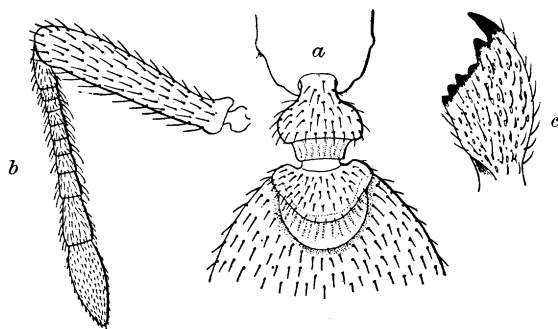


FIG. 4. *Erethomyrma Longii* sp. nov. Female. a. pedicel and base of gaster. (dorsal view.) b. antenna; c. mandible.

edge and the sides of the node ; concave posterior dorsal declivity and the whole ventral surface of the petiole opaque, very finely and densely punctate, the former in addition with indistinct rugæ radiating from the posterior edge of the segment. Postpetiole above in the middle shining, with several round foveolæ, which on the sides become prolonged backwards so that the surface has a somewhat grooved appearance ; lower surface opaque and densely punctate like the lower surface of the petiole. Gaster shining, the segments smooth and very finely and sparsely punctate at their bases but more opaque and evenly reticulate along their distal borders. In addition to this sculpturing there is a small cluster of impressed reticulations around the insertion of each hair. Legs coarsely punctate-foveolate.

Body, except the epinotum, covered with tawny hairs which are relatively shorter than in the worker. On the head, thorax and femora the hairs are erect, on the petiole, postpetiole and gaster suberect, on the antennæ, tibiæ and tarsi shorter and more appressed. Wings covered with minute black hairs.

Male.—(Fig. 5.) Length 5–5.5 mm.

Black ; venter and posterior margins of gastric segments fuscous ; antennæ whitish but appearing somewhat infuscated on account of a covering of very short black hairs ; antennal scape black, second joint paler than the succeeding joints. Mandibles reddish, black only at their bases. Tarsi infuscated from the tip of the first joint. Wings blackened, apical third hyaline ; veins and stigma black.

Mandibles longitudinally striated, especially at the base ; smooth and shining towards their tips. Clypeus shining in the middle, irregularly and coarsely rugose at its lateral and posterior edges. Head subopaque, with several systems of rather indistinct, parallel rugæ with smooth interrugal spaces ; one system runs transversely just behind the clypeus, another on either side from the frontal carina obliquely to the anterior ocellus, where it meets the corresponding series from the other side ; another system runs transversely between the two posterior ocelli, while still another is continued downwards from each of these ocelli to the sides and back of the head.

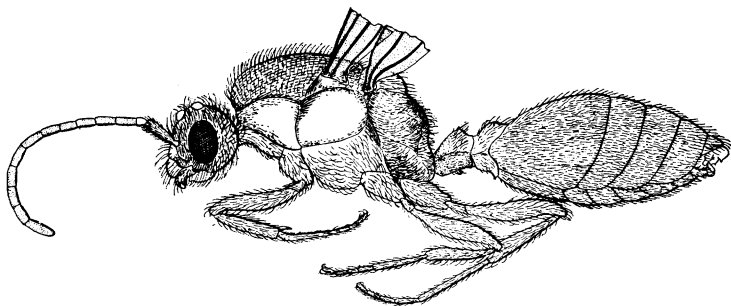


FIG. 5. *Erebonymrma Longii* sp. nov. Male.

Mesonotum subopaque, remainder of thorax smooth and shining except the neck and mesopleuræ which are opaque. Mesonotum with a smooth median band only on its anterior half, the remaining surface more densely covered with elliptical foveolæ than in the female. Metanotum and posterior portion of scutellum with fine parallel transverse rugæ. Mesopleuræ and sides of pronotum sparsely foveolate. Metapleuræ longitudinally rugose. Epinotum almost impunctate. Petiole and postpetiole somewhat roughened and subopaque, node of former smooth and shining, as is also the gaster. The sculpture of the gaster is like that of the female but more indistinct.

Body covered with rather dense, yellowish-gray hairs, which are suberect on the head, thorax and abdomen, but appressed on the legs. There are a few hairs on the shining surface of the epinotum and on the petiolar node. On the antennæ the hairs are microscopic, except on the scape where they are dense and rather conspicuous. Wings covered with minute black hairs.

Described from numerous workers and males and four females from Denton, Denton County, north Texas.

The genus *Erebomyrma* is to be placed in the Myrmicine tribe Solenopsidii, which is known to embrace the following genera: *Solenopsis* Westwood (cosmopolitan); *Diplomorium* Mayr (South Africa); *Aëromyrma* Forel (Madagascar); *Oligomyrmex* Mayr (India, Australia); *Carebara* Smith (Africa, Australasia); *Tranopelta* Mayr (South America); *Lophomyrmex* Emery (India); and *Pheidologeton* Smith (India and Australasia).¹ With the exception of the first and last, these genera are represented each by only one or a few species, and in some cases the sexual forms are imperfectly known. Of *Tranopelta* the workers are unknown, unless the workers from Paraguay mentioned by Mayr (Sued-afrikanische Formiciden, 1901, p. 17) as having a distinctly 3-jointed antennal club, 3-jointed maxillary palpi and very small eyes, belong to this genus. In view of these facts a future revision of the tribe Solenopsidii may lead to modifications in the definition of the genera including the one described in this paper. The genera *Aëromyrma*, *Oligomyrmex*, *Pheidologeton* and certain species of *Solenopsis* are characterized by having highly dimorphic workers. In many cases these are connected by a more or less complete series of intermediate forms in the same nest (*e. g.*, *Pheidologeton*, *Solenopsis geminata*). *Erebomyrma* agrees with *Diplomorium*, *Carebara* and most species of *Solenopsis* in having workers of one caste only, and these are extremely diminutive as compared with the males and especially the females. *Erebomyrma* is evidently most closely related to *Solenopsis*, *Diplomorium* and *Aëromyrma*, but differs from the two former in having the epinotum armed and from the latter in having 11- instead of 10-jointed antennæ, and in the absence of any dimorphism in the workers. The latter character is variable, however, since in one genus (*Solenopsis*) it is absent in most of the species, though highly developed in others. The female of *Erebomyrma* is colored and sculptured much like the female of the African *Carebara vidua* Smith, while the male seems to have many points in common with the male of *Tranopelta*. It is probable that *Erebomyrma*

¹ The genus *Melissotarsus* Emery, formerly supposed to belong to this group of genera, is now placed among the Ponerinæ by Emery.

is not a monotypic genus but comprises also several South American species. At least Professor Emery writes me that he has in his collection two species which seem to belong to the new genus. Both of these are represented by female specimens only. One is from Bolivia, the other from Rio de Janeiro.

Comparatively little is known concerning the ethology of the *Solenopsidii* apart from the genus *Solenopsis*, which has many representatives in Europe and North America. The majority of the species belonging to the tribe, if we except *Pheidologeton* and the larger forms of *Solenopsis*, like *S. geminata*, appear to have certain common ethological traits of more than usual interest. These characters, which were first appreciated by Forel, and constitute one of the many fine discoveries of that able naturalist, are the following :

1. The males and especially the females of the smaller species of *Solenopsis*, the species of *Aëromyrma*, *Carebara*, *Oligomyrmex*, and presumably also of *Tranopelta*, are of very large size compared with the workers. The same is also true of *Pheidologeton* and the polymorphic species of *Solenopsis* when the sexual forms are compared with the most diminutive caste of workers. The relative dimensions of the queens differ, however, considerably in the different genera. Thus in our common North American *Solenopsis molesta* the workers measure 1.5 mm. in length, the females 4.5–5 mm.; while in *Carebara vidua* the worker is hardly larger than that of *S. molesta* (1.5–2 mm.) whereas the female is of gigantic dimensions (23 mm.). The dimensions of *Erebomyrma Longii* lie between these extremes, though much nearer to those of *S. molesta*. The worker is 1.5–2.25 mm. long, the female 8–8.5 mm. If we cube the dimensions in these three species and make due allowance for the fact that the body of the female ant is in each case proportionally much thicker than that of the worker, we have the following roughly approximate ratios between the volumes of the workers and females :

<i>Solenopsis molesta</i> ,	1 : 20.
<i>Erebomyrma Longii</i> ,	1 : 150
<i>Carebara vidua</i> ,	1 : 2000.

These are rather extraordinary dimensions for queens as com-

pared with workers, especially when we reflect that they represent the sterile and fertile extremes of the same sex.¹

2. The workers of the species in question all have a pale, etiolated appearance, being uniformly yellow or light brown in color, while the huge males and females are deeply and often conspicuously colored. This is noticeably the case with *Carebara* and *Erebomyrma*.

3. The eyes of the workers are vestigial or quite absent (*Carebara*), in marked contrast with the well-developed eyes and ocelli of the males and females.

4. As we should naturally infer from the characters enumerated under 2 and 3, these ants are hypogæic or subterranean, *i. e.*, rarely or never coming to the surface except during the nuptial flight of the deeply colored sexual forms.

5. It is clear that the diminutive workers must be able to obtain large quantities of food, or they could never raise so many and such enormous males and females. From this, again, we may infer that the species prey on other ants or termites, and this inference is supported by observation in all cases where it has been possible to study these ants in their nests. The European *Solenopsis fugax*, the North African *S. latro*, the North American *S. molesta* and *S. texana*, and probably many other small species of the genus, live in the nests of larger ants belonging to different genera and species (*Formica*, *Aphænogaster*, etc.). Here they inhabit small chambers in the walls separating the galleries of the larger species and, escaping notice, probably on account of their minute size and neutral nest-odor, prey upon the helpless and well-fed larvæ and pupæ of their hosts. This mode of life has been recently called "*Ictobiosis*" by Forel, who has directed attention to similar habits in *Æromyrma* and *Carebara*. Sikora found *Æromyrma Nosindambo* Forel, of Madagascar, as a regular inhabitant in the earthen nests of termites, and Haviland

¹ Other cases comparable to the extreme disproportions of the female and worker *Carebara* are certainly rare but they occur nevertheless in *Pheidologeton* and in *Atta* (*s. str.*). The minimum workers of the Texan *Atta jervens* Say are barely 2 mm. long, whereas the queens measure fully 17 mm. Among some specimens of the Bengalese *Pheidologeton ocellifer* Smith given me by Professor Forel, I find diminutive workers only 2.25 mm. long and a queen of 16 mm. The relative differences in volume in these cases can be approximately computed without difficulty.

found *Carebara vidua* of South Africa also living in lestopobiosis in the clay nests of termites (*Termes natalensis*). A consideration of these facts and the taxonomic affinities of *Erebomyrma Longii* led me to surmise that this species too must be lestopobiotic, in all probability not with other ants but with some of our Texan termites. That the species is hypogæic would seem to be perfectly clear from Mr. Long's statements quoted in the opening paragraphs of this paper. A second letter, in response to a request urging him to search for termite nests on the spot where he found the *Erebomyrma*, tends to confirm my suspicions of its lestopobiotic habits. Mr. Long says: "There seems to be a great number of termites in this vicinity, as I found the sexual forms issuing in great numbers from many holes in my back yard, just like the ants of the new genus which I sent you. Several of these holes were very close to the spot where the ants were captured." During the coming year Mr. Long will endeavor to obtain more definite data concerning the habits of the interesting ant which he has brought to my notice.

AUSTIN, TEXAS,

November 29, 1902.